

## Session 1: Biology

K M Old

CSIRO Division of Forestry, PO Box 4008, Queen Victoria Terrace, Canberra ACT 2600

The first paper scheduled for this session was a personal account of the impact of European settlement on native vegetation communities as seen from the perspective of a plant pathologist, and focussing on *Phytophthora*-induced dieback. The paper was presented by Dr Frank Podger and was based on his career-long involvement in the study of diseases of forests and native plant communities, including the first association of *P. cinnamomi* with jarrah dieback. He pointed out that *Phytophthora*-induced diseases of native vegetation is a national problem, with regional circumstances of climate, soil and vegetation differences demanding differing approaches to management. Accidental introduction of *P. cinnamomi* into native vegetation has caused major changes in plant communities and despite the enhanced level of awareness of the consequences of disease, there are major difficulties in achieving containment. He pointed out the dangers of over-emphasis on reductionist research which may provide information that cannot be translated to practical solutions for reducing the spread and impact of *Phytophthora* spp. and advocated a holistic approach to disease management.

Although it was appropriate for a paper on *Phytophthora* to lead this session, the second speaker, Dr Bryan Shearer, gave a much broader picture of the range of pathogens that currently affect the health of native plant communities in south western Australia. He pointed out the need for systematic disease surveys of such communities, and the need to maintain adequate mycological expertise within government agencies and the universities. Without such skills, the recognition and containment or control of epidemics will not

even be attempted. A database, which is being compiled for a wide range of families and their diseases, is a first essential step in an assessment of the significance of the main groups of diseases including root rots, stem cankers and leaf diseases.

The final paper in the session was a discussion by Dr Elaine Davison of the role of environment in the dieback of jarrah, especially the effects of waterlogging on the physiology and anatomy of tree roots, and root infection by *P. cinnamomi*. Although the epidemic disease, which is so damaging on the understorey and ground cover in the jarrah forest, Banksia woodland and heathlands, appears to have a somewhat simple etiology, the impact of the fungus on large jarrah trees is more cryptic. Of the several hypotheses to explain local and rapid death of large trees in the jarrah forest over the last two decades, none have proved to apply unequivocally to all circumstances. This partly reflects the inherent difficulty of diagnosis of dieback diseases in large trees. However, controlled glasshouse studies coupled with field investigation suggest that periodic waterlogging may contribute to death by direct effects on root conductivity (through induction of tyloses) and predisposition of roots to infection by *P. cinnamomi*.

The three papers emphasised the need for a multidisciplinary approach to the management of dieback diseases of native vegetation. Systematic gathering of information and rigorous study of the etiology of diseases, host pathogen interactions and of environmental effects are needed for the development of effective management prescriptions.

---

Symposium on Plant Diseases in Ecosystems:  
Threats and impacts in south-western Australia.

Held on April 16, 1994, at Murdoch University, by the Royal Society of Western Australia and the Ecological Society of Australia.

© Royal Society of Western Australia 1994